The University of California San Francisco Shared Research and Teaching Laboratory: a Non-Federal Human Embryonic Stem Cell Resource for the Bay Area Community

Grant Award Details

The University of California San Francisco Shared Research and Teaching Laboratory: a Non-Federal Human Embryonic Stem Cell Resource for the Bay Area Community

Grant Type: Shared Labs

Grant Number: CL1-00523-1.1

Investigator:

Name:	Linda Giudice
Institution:	University of California, San Francisco
Type:	PI

Award Value: $2,144,758

Status: Closed

Grant Application Details

Application Title: Shared Research and Teaching Laboratory: a Non-Federal Human Embryonic Stem Cell Resource for the Bay Area Community

Public Abstract:

The University of California, San Francisco (UCSF) has a long history of making innovative discoveries that change the way scientists and clinicians think about disease processes and their approaches to finding cures. Accordingly, researchers at this institution were quick to appreciate the enormous promise of human embryonic stem cells (hESCs) as research tools for understanding how the body normally works, thus laying the groundwork to identify disease-related aberrations. Therefore, in 2001, when the federal government decided to limit government funding to work with existing hESCs, which they banked, U.S. scientists were faced with a dilemma. Would we abide by these unprecedented restrictions, which meant that research would be limited to first-generation cells, or could we find ways to develop second-generation, higher-quality hESCs? Investigators on our applicant team took both approaches. Since UCSF contributed two hESC lines to the federal registry, our team members participated in the government's program to distribute these cells, which entailed teaching scientists how to use them. We also sought nonfederal funding sources to derive new hESC lines. Thus, we have a great deal of experience that is directly relevant to achieving the California Institute for Regenerative Medicine's (CIRM's) goal of establishing Shared Research Laboratories that also offer hands-on courses. We give the highest priority to teaching hESC techniques in the context of the ethical issues surrounding this work. Here, we propose to expand the nonfederal laboratory space that already exists at UCSF. Renovating and equipping an adjacent lab will significantly increase our capacity for growing and analyzing second and subsequent generations of hESCs. Our goal is to make the existing space, renovated with UCSF funds, and the new lab to be created with this CIRM award, available to our colleagues. We also want to jump-start their work by teaching them how to grow and analyze hESCs. Thus far, 16 graduate- and postgraduate trainees are funded by our CIRM training grant; 32 UCSF scientists have applied for CIRM SEED and Comprehensive grants, and we expect many more will follow. We also want to support the work of our colleagues at 10 neighboring institutions. At the same time, we will use this lab to derive new and higher-quality hESC lines. We will also teach these techniques to highly motivated California scientists. Our work is important because the researchers who use our laboratory are studying the causes of major human diseases that occur as the result of trauma (e.g., paralysis), cell death (e.g., Parkinson's and Alzheimer's diseases, diabetes, cardiac failure), or cell malfunction (e.g., cancer). Thus, by sharing our laboratory space, scientific equipment and technical expertise with colleagues at UCSF and other institutions, we will play an important role in helping scientists accomplish CIRM's ultimate goal of finding cures for human diseases.

Statement of Benefit to California:

By voting in favor of Proposition 71, which funds research involving human embryonic stem cells (hESCs) that is not supported by the federal government, the citizens of California sent a clear message that they want scientists in our state to play an important role in research that could revolutionize medical treatments and render significant economic benefits. Currently, these treatments largely consist of surgical or pharmacological interventions, and transplantation approaches that involve significant hurdles. For example, human cells carry unique identifiers—molecular "bar codes"—that must be closely matched or the transplant will be rejected. And, unless the bar codes match perfectly, the recipient has to take powerful drugs to suppress rejection. Finally, there are major shortages of cells and organs for use in transplantation procedures. With the advent of hESCs, researchers are envisioning new therapeutic approaches. In theory, these cells, the building blocks of the entire body, can become any cell type. Thus, there is a great deal of excitement about using hESC-based transplantation techniques to cure human diseases. Why haven't these approaches moved forward full throttle? In 2001 the federal government limited hESC research to existing cell lines. This unprecedented move created additional barriers. If scientists want to make new hESC lines or work with higher-quality cells that were established after 2001, they have to use labs that are completely devoid of government funding—that means building materials, equipment and supplies. Therefore, these labs must be created with funds from nonfederal sources, one of the reasons that the California Institute for Regenerative Medicine was created. We envision that our proposed Shared Research Laboratory and Teaching Facility will help us create a major center for conducting the most exciting aspects of hESC research that will ultimately lead to cures for many of the most devastating human diseases.

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